

REMARKS

The telephone interview with Examiner Padgett on July 6, 2005 is acknowledged. The new matter rejection was discussed and the Examiner noted that the rejection of record was deemed proper because the exact density range of the claims was not in the original application. It was pointed out that the density was an average computed by taking the disclosed densities and preparing an average. The Examiner was of the opinion that the average was not a proper interpretation of the disclosed densities but indicated that the average plus the deviation would be considered. The Examiner was also noted that the insertion of a hydrogen % of 16 to 52 percent would avoid the rejection that was directed to the use of the term 30-52 hydrogen %. The cancellation of claims 1-3 and 7-8 was acknowledged as avoiding the rejection of those claims. The Examiner agreed to consider the proposed amendments but no commitment as to the allowability of the claims was made.

This Amendment deletes the subject matter identified as new matter and the ranges of thicknesses and density, as set forth in claims 15, 19, 23, 24 and 28 are supported either by example 8 or 9 in Table 8 of the specification. The thicknesses have been based on an average of the disclosed thicknesses for the container with a calculated standard deviation that has been calculated using a standard mathematical formula. The densities have been calculated in the same manner. For example, the thicknesses of example 8 were reported as 277, 219 and 215 Å which gives an average of 237 Å. The standard deviation has been calculated using a standard formula as 34.699 which has been rounded to 34.7 Å. The densities have been calculated in the same manner. For these reasons, it is requested that the new matter rejection be withdrawn.

The Examiner then rejected Claims 15, 19, and 24-27 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In response, applicant has amended Claims 15, 19, 24, and 25 to contain only subject matter which was described in the specification as currently amended. The amendment to the hydrogen atomic %, while broadened, is not new matter

and finds support in the original claims. Additionally, as this amendment finds support in the disclosure, the need for the Japanese priority document is rendered moot. Therefore, applicant requests removal of this ground of rejection.

The Examiner then rejected Claims 1, 3-5, 7-8, 11, and 20-23 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response, applicant has canceled Claims 1, 3, 7 and 8. Additionally, applicant has deleted the term "a top portion" from Claims 4 and 5. Applicant has also amended Claims 11, 21, and 22 to read "outer electrodes" instead of "outer electrode" and Claim 22 was further amended to include a positive recitation. Claim 20 was amended to depend from Claims 4 or 5. Claim 23 was amended to eliminate several typographical errors. Claims 9-10 were amended to eliminate a lack of proper antecedent basis problem and the term "only" has been added in the last line of claims 4 and 5 to make it clear that it is the first outer electrode that is connected to the HF oscillator. Therefore, applicant requests removal of this ground of rejection.

The Examiner then rejected Claims 1, 3, 7-8, and 20-23 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. In response, applicant has canceled Claims 1, 3, and 7-8. Additionally, applicant has also amended Claims 21 and 22 to read "outer electrodes" instead of "outer electrode" and Claim 22 was further amended to include a positive recitation. Claim 20 has been amended to depend from Claims 4 or 5. Claim 23 has been amended to correct the syntax of the terms used in the claims. Therefore, applicant requests removal of this ground of rejection.

The Examiner then rejected Claims 1, 3, 7-8, and 20-23 under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for when the second electrode is above the upper edge of the first in the claimed relationship to the center, when the containers are viewed in an upright position, does not reasonably provide enablement for the electrodes overlapping adjacent to the side of the container with the interposing [insulator...] element in between. In response, applicant has canceled Claims 1, 3, and 7-8. Additionally, applicant

has also amended Claims 21 and 22 to read "outer electrodes" instead of "outer electrode" and Claim 22 was further amended to include a positive recitation. Claim 20 was amended to depend from Claims 4 or 5. Therefore, applicant requests removal of this ground of rejection.

The Examiner then noted that the date on the transmittal paper for the international filing date was incorrectly given and that the Bibliographic information in the PTO's system has been corrected to reflect the proper information. Applicant apologizes for any inconvenience on the Examiner's part and thanks the Examiner for the correction.

The Examiner then rejected Claims 1, 3-5, 7, 8, 9-11 and 20-23 under 35 U.S.C. 112, first paragraph because the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with the claims. In response, applicant has canceled Claims 1, 3, 7, and 8, and applicant has amended the specification.

More specifically, the proposed amendment to the specification restricts the interposed elements to be used as insulating only. The Examiner's indicated example in #9 of the Office Action ("sections of electrodes might employ an o-ring to create an air tight seal when joined, but be configured so that the sections are in electrical contact, thus not producing a gap which effects an insulating effect as required by the teaching of the specification") is thus rendered moot since the electrodes now have no possibility of connecting to each other in a direct current. The gap between electrodes is necessary to create the insulating state (see drawing below). The o-ring creates an airtight seal, and the gap creates the insulation. Therefore, applicant requests removal of this ground of rejection.

The Examiner then rejected Claims 1, 3-5, 7, 9-11, and 22-23 under 35 U.S.C. 103(a) as being unpatentable over Shimamura (JP 10-226,884), optionally further in view of Zenitani Toshihiro et al (JP 11-256,331). Applicant respectfully requests reconsideration and removal of this ground of rejection.

More specifically, there is a distinction between applicant's invention and the disclosure of Shimamura in that high-frequency ("HF") power imparts power to only the first outer electrode. Additionally, applicant's invention has the restriction that the HF terminal is prohibited from connecting to any electrodes other than the first outer electrode and each electrode is electrically isolated by interposed members, as per the current amendments.

In Shimamura, a HF power source is connected to all parts (30Aa and 30Ab which there is an insulating member between) except a bottom portion (30B) which is not insulated from 30Ab, and electric current is applied to these devices directly. In the case where HF power imparted to each part is adjusted by using an apparatus disclosed in Shimamura, two or more HF power sources are required. If using only one HF power source in Shimamura, HF power must be imparted to an upper electrode and a lower electrode separately, and as a result, required time for deposition is at least doubled. Additionally, the longer the duration the HF power is applied to the electrodes, the more severe the heat deterioration of the container becomes. Applicant's invention discloses that which makes it possible to form a film on the entire inner surface of a container by applying HF power to only the bottom electrode. When compared to Shimamura, applicant's invention makes it possible to reduce the cost of the apparatus and manufacturing deposition time, and length of time exposed to heat. In the Zenitani reference, insulating members are applied in a plasma-increasing means (i.e., magnetic field generation means), but the first cathode 5 and the second cathode 6 are connected electrically to each other. Therefore, the invention of Zenitani is very different from the structure of the present invention. Therefore, it would not be obvious to one skilled in the art to modify the disclosure of Shimamura with the disclosure of Zenitani to create applicant's invention. Therefore, applicant respectfully requests removal of this ground of rejection.

The Examiner then rejected Claims 1, 3-5, 7, 9-11, and 22-23 under 35 U.S.C. 103(a) as being unpatentable over Shimamura (WO 98/37259) considering USPN 6,294,226 B1 the national stage as a translation. Applicant

respectfully requests reconsideration and removal of this ground of rejection based on the above remarks.

The Examiner then noted that amendment of the product claims required a range that was contradicted by the data in the specification (tables 6-7). In response, as discussed above, applicant amended the specification to recite an average density as opposed to a range of densities. Therefore, applicant respectfully requests removal of this ground of rejection. The Tomaswick container is coated with DLC film having density $1.7 - 1.8 \text{ g/cm}^3$. The following tests show the superiority of the low density range for the present application:

(1) A container of the present invention was compared with the container of Tomaswick. The oxygen permeability of the container according to the present invention does not increase (i.e. oxygen barrier property does not deteriorate), even if the container is shocked or deformed. On the other hand, the oxygen permeability increases due to the shock or deformation in a container coated with DLC film having the density range $1.7 - 1.8 \text{ g/cm}^3$ (equivalent to the Tomaswick container). This shows the superiority of the claimed container in terms of resistance to shock or deformation.

The test was carried out as follows:

Three different kinds of DLC films were coated on surface of each PET films (size $190 \times 120 \text{ mm}$, thickness $125\mu\text{m}$). Density of each DLC films were 1.25, 1.40, 1.60, 1.75 g/cm^3 . Thicknesses of every DLC films were 30nm.

Each PET films was tested for tensile strength test (0.5mm/minutes) and observed under a laser microscope and the oxygen barrier property was measured before and after the tensile test were carried out. The laser microscope was used to detect and evaluate any cracks. The oxygen barrier property was evaluated as follows:

The oxygen permeability of the sheet coated with DLC film having density 1.75 g/cm^3 was set at 100 as standard value (value before tensile test). And

oxygen permeability of other samples were shown as relative values to the standard value. (see formula 1)

(Formula 1)

$$\text{Barrier Property} = (\text{Oxygen permeability of density } 1.75 \text{ g/cm}^3 \text{ (before tensile test)} / \text{oxygen permeability of sample}) \times 100$$

(Test Results)

density g/cm ³			default (before tensile test)	2% tension	4% tension	6% tension	12% tension
sheet 1	1.25	presence of crack	NO	NO	NO	Present	Present
		oxygen barrier property	28	23	20	18	11
sheet 2	1.44	presence of crack	NO	NO	Present	Present	Present
		oxygen barrier property	85	80	70	59	27
sheet3	1.60	presence of crack	NO	NO	Present	Present	Present
		oxygen barrier property	90	74	62	49	20
sheet 4	1.75	presence of crack	NO	Present	Present	Present	Present
		oxygen barrier property	100	59	45	29	13

- (i) In sheet 1, the crack was detected at 6% tension.
In sheet 2 and 3, the crack was detected at 4% tension.
In sheet 4, the crack was detected at 2% tension.
- (ii) The default values of oxygen barrier property of each sheets were :
sheet 4 > sheet 3> sheet 2 >> sheet 1.
- (iii) The evaluation results of oxygen barrier property after the tensile test were shown as follows;
 - (a) In sheet 1, range of drop of oxygen barrier property was small through the tensile tests, but the default value was too low.
 - (b) In sheet 2 and 3, range of drop of oxygen barrier property was small until 6% tension test.
 - (c) In sheet 4, the default value was high, but oxygen barrier property had decreased by a large margin even at 2% tension test.

The above results demonstrate that the container coated DLC film having the density 1.75 g/cm^3 has a high failure rate as to the oxygen barrier property, and the container is vulnerable to shock or deformation and deteriorates with a small shock or deformation. Specifically a crack was detected at 2% tension in the container coated DLC film having the density 1.75 g/cm^3 .

On the other hand, the containers coated with DLC film having a density 1.44 and 1.60 g/cm^3 , respectively have an oxygen barrier property which is slightly inferior to the higher density, but the containers are superior in terms of resistance to shock or deformation.

Regarding the container coated with DLC film having the density 1.25 g/cm^3 , the range of deterioration is small, but the default value of oxygen barrier property is much lower when compared to the density 1.75 , 1.60 or 1.44 g/cm^3 .

For the above reasons, the superiority of the DLC film having lower densities, which closely approximate the densities of the amended claims, is quite evident as compared to the higher densities of the prior art.

The Examiner's acknowledgement of the translation of Toshimichi Ito and the existence of the copending cases of Nagashima has been noted

The Examiner then provisionally rejected Claims 1, 3-5, 7, 9-11 and 22-23 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-17 of copending Application No. 10/452,208 in view of Shimamura (884 or WO). In response, applicant is filing a terminal disclaimer with this Amendment. Therefore, applicant respectfully requests removal of this ground of rejection.

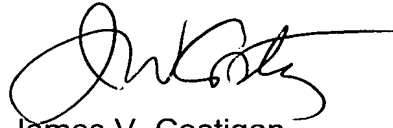
The Examiner then noted that Claims 8 and 20-23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph and to include all the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for so noting. Claim 8 has been amended to overcome the rejection under 35 U.S.C. §112 by revising the terms that were used to point out the orientation of the electrodes. Claims 20-23 are now in condition for allowance because these claims and the prior claims 4 have been amended to obviate the rejections for indefiniteness.

New claims 28 and 29 point out preferred embodiments of the invention. Claim 28 is based on Test 9 of Table 6 and claim 29 is based on Test 7 of Table 6.

In light of the foregoing applicant respectfully submits that the claims of the present application are in proper form for allowance.

Favorable consideration and early allowance are therefore respectfully requested and earnestly solicited.

Respectfully submitted,



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